UNITED STATES PATENT AND TRADEMARK OFFICE

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FLEIT KAIN GIBBONS GUTMAN BONGINI & BIANCO
21355 EAST DIXIE HIGHWAY
SUITE 115
MIAMI, FL 33180

EXAMINER
SUBRAMANIAN, NARAYANSWAMY

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _20 June 2007_. ·

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-20 and 23-29_ is/are pending in the application.

   4a) Of the above claim(s) _8,9,14,15,17,18 and 20_ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-7,10-13,16,19 and 23-29_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)	4)☐ Interview Summary (PTO-413)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____ .
3)☐ Information Disclosure Statement(s) (PTO/SB/08)	5)☐ Notice of Informal Patent Application
Paper No(s)/Mail Date _____ .	6)☐ Other: _____ .

DETAILED ACTION

1.   This office action is in response to applicants' request for continued examination filed on

June 20, 2007. Amendments to claims 1-4, 6, 10-11, 13 and 23-25, cancellation of claims 21-22

and addition of claims 28-29 have been entered. Claims 1-20 and 23-29 are pending in the

application of which claims 8, 9, 14, 15, 17, 18 and 20 are withdrawn from consideration as

being drawn to a non-elected species. Claims 1-7, 10-13, 16, 19 and 23-29 have been examined.

The rejections and response to arguments are stated below.

Claim Rejections - 35 USC § 101

2.   35 U.S.C. 101 reads as follows:

   Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and
requirements of this title.

3.   Claims 1-7, 10-13, 16, 19 and 23-29 are rejected under 35 U.S.C. § 101 because the

claimed invention is directed to non-statutory Subject matter.

   35 USC 101 requires that in order to be patentable the invention must be a "new and

useful process, machine, manufacture, or composition of matter, or any new and useful

improvement thereof" (emphasis added).

   Claims 1-7, 10-13, 16, 19 and 23-29 are drawn to "a method, a system and a computer

program product for visualization of real world data by displaying a plurality of points in a phase

space" and to "a method for visualization of financial data in a phase space". As such the

claimed invention is directed to a judicial exception to 35 U.S.C. 101 (i.e., an abstract idea,

natural phenomenon, or law of nature) and is not directed to a practical application of such

judicial exception because the claims do not require any physical transformation and the

invention as claimed does not produce a useful, concrete, and tangible result.

The Court of Appeals for the Federal Circuit issued opinions in State Street Bank & Trust Co. v. Signature Financial Group Inc., 149 F. 3d 1368, 47 USPQ2d 1596 (Fed. Cir. 1998) and AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352, 50 USPQ2d 1447 (Fed. Cir. 1999). These decisions explained that, to be eligible for patent protection, the claimed invention as a whole must accomplish a practical application. That is, it must produce a "useful, concrete and tangible result." State Street, 149 F.3d at 1373-74, 47 USPQ2d at 1601 02. To satisfy section 101 requirements, the claim must be for a practical application of the § 101 judicial exception, which can be identified in various ways: (a) The claimed invention "transforms" an article or physical object to a different state or thing. (b) The claimed invention otherwise produces a useful, concrete and tangible result, based on the factors discussed below.

The USPTO's official interpretation of the utility requirement provides that the utility of an invention has to be (i) specific, (ii) substantial and (iii) credible. See MPEP § 2107. It is not clear as to what is the utility of computing and displaying a point in space. The utility of the claimed invention is not specific, substantial and credible. It is not clear as to what is the specific, substantial and credible utility of "providing as an output of the electronic processor a display of the point in phase space" or "enabling the visualization of the sub-space on the medium selected".

The tangible requirement does require that the claim must recite more than a § 101 judicial exception, in that the process claim must set forth a practical application of that § 101 judicial exception to produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77 (invention ineligible because had "no substantial practical application"). It is not clear as to what is the practical application of "providing as an output of the electronic processor a display

of the point in phase space" or "enabling the visualization of the sub-space on the medium

selected".

For an invention to produce a "concrete" result, the process must have a result that can be

substantially repeatable or the process must substantially produce the same result again. In re

Swartz, 232 F.3d 862, 864, 56 USPQ2d 1703, 1704 (Fed. Cir. 2000) (where asserted result

produced by the claimed invention is "irreproducible" claim should be rejected under section

101). The opposite of "concrete" is unrepeatable or unpredictable. The steps of the claims are not

sufficiently precise enough to guarantee that the same result will be produced for the same sets of

inputs. Hence the claimed invention does not produce concrete result.

There is no useful, concrete and tangible result produced from implementing the steps of

the claimed invention. The dependent claims are rejected for the same reason and by way of

dependency on a rejected independent claim.

Claim Rejections - 35 USC § 112

4.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter, which the applicant regards as his invention.

5.   Claims 23-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for

failing to particularly point out and distinctly claim the subject matter which applicant regards as

the invention.

Claim 23 recites the limitation "a scaler for scaling the calculated volatility with a factor

dependent on the length of the first sequence". Similarly claim 25 recites "scaling the volatility

with a factor dependent on the length of the first sequence". These limitations lack antecedent

basis because "first sequence" is not defined in one of the preceding steps. Claim 24 is rejected

by way of dependency on claim 23. Appropriate correction/clarification is required.

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

7.   Claims 1-7, 10-13, 16, 19 and 23-29 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Stewart (US Patent 6,195,103 B1) in view of Caccavale (US Patent

5,664,106).

Claims 1, 23 and 25, Stewart teaches a method, system and a computer program product

for visualization of real world data by displaying a plurality of points in a phase space, the

method comprising the steps of, for each point: providing a sequence of data samples

corresponding to the real world data measured in relation to a dimension (See Column 3 line 32

– Column 6 line 45, for instance time series data of a financial instrument); calculating and

storing with an electronic processor a single volatility of the sequence (See Column 3 line 32 –

Column 6 line 45, computing the distance implies this feature); scaling and storing with the

electronic processor the volatility with a factor, the factor being dependent on the length of the

first sequence (See Column 3 line 32 – Column 6 line 45, multiplying distance by scale factor,

for instance in the computation of the standard deviation the factor is dependent on the length of

the sequence); calculating and storing with the electronic processor a net change in the data as a

difference between data samples within the sequence, in accordance with the formula stated in

the claim (See Column 6 lines 54-65, the disclosed by Stewart is the same as the one stated by

the applicant). A system for performing these steps and a computer program product for use on a

client computer are inherent in the disclosure.

Stewart does not explicitly teach the steps of determining and storing with the electronic

processor a first and a second coordinate value of a point in phase space based on the volatility

and the net change; and providing as an output of the electronic processor a display of the point

in phase space.

Official notice is taken that these steps are old and well known in the financial art. For

instance computing the expected return and variance of a security and plotting in the mean-

variance space has been in vogue at least for the last three decades. This plot helps in the

selection of securities according one's risk-return preferences.

It would have been obvious to one of ordinary skill in the art at the time of invention to

modify Stewart to include this feature. The combination suggests that users would have benefited

from selecting a security according to their risk-return preferences.

Claim 28, Stewart teaches a method for visualization of financial data in a phase space,

the method comprising the steps of: (a) providing a plurality of sequences of data samples, each

corresponding to the financial data over time (See Column 3 line 32 – Column 6 line 45, for

instance time series data of a financial instrument), and for each of said at least one sequences:

(i) calculating a single volatility of the sequence; (ii) scaling the volatility with a factor, the

factor being dependent on the length of the sequence (See Column 3 line 32 – Column 6 line 45,

multiplying distance by scale factor, for instance in the computation of the standard deviation the

factor is dependent on the length of the sequence); (iii) calculating return as a difference between data samples within the sequence, in accordance with the formula stated in the claim (See Column 6 lines 54-65, the disclosed by Stewart is the same as the one stated by the applicant).

Stewart does not explicitly teach the steps of (iv) determining a first and a second coordinate value of a point in phase space based on the volatility and the return; and (v) displaying the point in phase space using a medium selected from the group consisting of: computer display, printed media; and (c) for a plurality of said plurality of sequences of step (b): (i) calculating a probability distribution of the calculated return values; (ii) providing a probability threshold value; and (iii) defining a sub-space of the phase space based on the probability distribution and the probability threshold value; and (iv) enabling the visualization of the sub-space on the medium selected.

Official notice is taken that these steps are old and well known in the financial art. For instance computing the expected return and variance of a security and plotting in the mean-variance space has been in vogue at least for the last three decades. This plot helps in the selection of securities according one's risk-return preferences. Computing a probability distribution of the calculated return values using the expected return and variance/standard deviation and plotting them is old and well known in the art of Finance and Statistics. This plot enables one understand the variability of the returns and helps in making informed decisions.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Stewart to include this feature. The combination suggests that users would have benefited from selecting a security according to their risk-return preferences and make informed decisions based on their understanding of the variability of the returns.

Claims 2-7, 10-13, 16, 19, 24, 26-27 and 29 the features in these claims are either

disclosed by Stewart or are old and well known. The inclusion of these features would help make

the computation more robust and efficient.

Response to Arguments

8.   In response to Applicant's arguments "The Applicant asserts that the machine

implemented method claims of the presently claimed invention are not solely the "manipulation

of an abstract idea," but rather a practical process to produce tangible, useful, results", the

examiner respectfully disagrees. The final step of the independent claims recite "providing as an

output of the electronic processor a display of the point in phase space" or "enabling the

visualization of the sub-space on the medium selected". It is not clear as to what is the utility of

the display of the point or the sub-space. As discussed in the rejection above there is no useful,

concrete and tangible result produced from implementing the steps of the claimed invention.

Computerizing a method that is not statutory does not make the computerized method statutory.

In *State Street* the useful, concrete and tangible result is the price of the security, which could be

used in making trading decisions. However in the applicant's claimed invention it is not clear as

to what is the utility of the display of the point or the sub-space.

In response to Applicant's arguments "Stewart does not disclose logarithmic

compensation of the data, either in calculating the return, or in calculating the volatility. Stewart

further is limited to financial data, and more particularly to returns", the examiner respectfully

disagrees. The formula disclosed by Stewart (See Stewart Column 6 lines 54-65) is the same as

the one stated by the applicant. The approximation of the logarithmic returns is the last part of

the Applicant's equation. Further, the applicant's claim 28 is directed to a method for

visualization of financial data and includes the steps of computing returns and manipulation thereof. Applicant's other independent claims are directed to a method, system and a computer program product for visualization of real world data. Returns on securities is real world financial data as exemplified by Applicant's own claim 3. With respect Applicant's arguments about scaling the volatility by a factor that depends on the length of a sequence, the examiner would like to point out that this step is inherent in the computation of a variance or standard deviation of time series data.

Applicant's other arguments with respect to pending claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Narayanswamy Subramanian whose telephone number is (571) 272-6751. The examiner can normally be reached Monday-Thursday from 8:30 AM to 7:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kambiz Abdi can be reached at (571) 272-6702. The fax number for Formal or Official faxes and Draft to the Patent Office is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PMR or Public PAIR. Status information for unpublished applications is available through Private PMR only. For more information about the PMR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

N. Aub

Dr. N. Subramanian
Primary Examiner
Art Unit 3692

August 19, 2007